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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

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Applicant: Berman et al.
Serial Number: 10/668,021
Filed: 2003.09.22
Title: Pad Conditioner Setup
Examiner: Maurina T. Rachuba
Group Art Unit: 3723
Attorney Docket: 03-0915

APPLICANTS' BRIEF ON APPEAL

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O Box 1450
Alexandria VA 22313-1450


Via Fax at 1.703.872.9306

Sir:

Applicants hereby submit this brief on appeal from the examiner's final rejection of 2005.01.19 of claims 1-9 and 19-20, in compliance with 37 CFR 41.37. The Commissioner is authorized to charge whatever fee may be associated with the filing of this updated appeal brief, and any other fees required such as extensions of time, to the LSI Logic Corporation deposit account number 12-2252.

I hereby certify that this correspondence is being transmitted by facsimile to the Patent and Trademark Office in accordance with § 1.6(d) on the date below.

2005.06.17
Date


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I. REAL PARTY IN INTEREST

The real party in interest is LSI Logic Corporation, a corporation of Delaware, and assignee of record of the entire right, title, and interest in and to the invention and application for patent thereon from the inventors Michael J. Berman and Jan Fure.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

III. STATUS OF CLAIMS

Claims 1-9 and 19-20 are in the case and stand rejected under 35 USC § 102(a) or (e) over USPN 6,477,447 to Lin. Claims 10-18 have been cancelled. The claims on appeal are claims 1-9 and 19-20, as given in the Appendix.

IV. STATUS OF AMENDMENTS

Applicants have not amended the claims at any time.

V. SUMMARY OF CLAIMED SUBJECT MATTER

A concise summary of the subject matter claimed in the independent claims 1 and 19 is now provided. References to the text of the specification are made parenthetically, in the following manner (Spec. Page:Lines). References to the figures are also made parenthetically, in the following manner (Fig. Number:Element).

Claim 1 recites a method for inspecting the uniformity of the pressure applied between a conditioner (Spec. 8:10-18, and 9:7-22) (Figs. 1-2:12) and a polishing pad (Spec. 8:4-7) (Figs. 1-2:16) on a chemical mechanical polisher (Spec. 8:19-28) (Fig. 1:10). A sheet of pressure sensitive material (Spec. 10:11-20) (Figs. 2-4:40) is placed between the conditioner and the polishing pad, and the conditioner is lowered onto the sheet of pressure sensitive material. A desired degree of pressure is applied between the conditioner and the polishing pad, thereby creating an impression (Figs. 3-4:42) in the sheet of pressure sensitive material, and the conditioner is lifted from the sheet of

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pressure sensitive material. The sheet of pressure sensitive material is inspected to determine the uniformity of the pressure applied between the conditioner and the polishing pad.

Independent claim 19 additionally recites that the inspection process is accomplished by optically scanning and digitizing the impression on the sheet of pressure sensitive material (Spec. 10:21-29), and comparing the scanned and digitized impression to a database of scanned and digitized impressions (Spec. 12:8-15). Sources of any non-uniformities detected in the pressure applied between the conditioner and the polishing pad are corrected.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 1-9 and 19-20 are patentable under 35 USC § 102(a) or (e) over Lin.

VII. ARGUMENTS

(i) WHETHER CLAIMS 1-9 AND 19-20 ARE PATENTABLE UNDER 35 USC § 102(A) OR (E) OVER LIN.

CLAIMS 1-7

Claims 1-7 are argued as a group, and are patentably distinct from claims 8 and 19, and 9 and 20, as described in more detail hereafter. Claim 1 recites, *inter alia*, a method for inspecting a uniformity of pressure applied between a conditioner and a polishing pad on a chemical mechanical polisher, by placing a sheet of pressure sensitive material between the conditioner and the polishing pad, lowering the conditioner onto the sheet of pressure sensitive material, applying a desired degree of pressure between the conditioner and the polishing pad, thereby creating an impression in the sheet of pressure sensitive material, lifting the conditioner from the sheet of pressure sensitive material, and inspecting the sheet of pressure sensitive material to determine the uniformity of the pressure applied between the conditioner and the polishing pad. Thus, claim 1 is directed toward improvements in a *conditioning* subsystem and not a *wafer polishing* subsystem.

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Lin does not describe such a method. Specifically, Lin only describes taking pressure readings from within a chain of “pressure related components” that all have to do with the *wafer polishing* subsystem of a chemical mechanical polisher. Lin does not contemplate or in any way describe components within the *conditioner* subsystem of a chemical mechanical polisher. As described by Lin, the present application, and Berman, the wafer polishing subsystem and conditioner subsystem are two separate subsystems of a chemical mechanical polisher. Thus, the rejections are based on an impermissible broadening of the phrase “pressure related components” as used by Lin. This impermissible broadening occurs because the definitions of the phrase as provided by Lin have been overlooked by the examiner. Further, the examiner impermissibly misconstrues the Berman reference to indicate something which it does not. When this phrase is restricted to the breadth that was intended by Lin, then the claims of the present application are allowable.

For example, Lin depicts only *wafer* polishing components, and does not depict any conditioner components. Lin always describes his embodiments in relation to the wafer polishing components, as follows: “for pressure-sensing of a *wafer* surface” (column 2 line 41), “various pressure related components during a *wafer* CMP process” (column 2 lines 52-53), “on the surfaces of the *wafer* and the pressure related components” (column 2 lines 66-67), “detecting pressure distribution on a *wafer* surface” (column 3 lines 4-5), “subjecting the *wafer* and the pressure related components to various pressure conditions” (column 3 lines 13-14), “it is an object of the present invention to provide a method of pressure detection on the surfaces of the *wafer* and the pressure related components” (column 4 lines 15-17), emphasis added.

In each instance, Lin describes sensing pressure in regard to a *wafer*, and *not* a *conditioner*. The “pressure related components” as recited by Lin are those components that are used to apply pressure on the surface of the wafer. However, these are not the components that are used to apply pressure to the conditioner.

The examiner asserts that a conditioner fall under the definition of “pressure related components.” However, this logic is faulty. Lin effectively defines “pressure related components” in at least two different places in the reference. Lin states that “the invention relates to a method of detecting pressure distribution on a *wafer* surface by

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employing pressure sensitive films located on various *pressure components* such as a wafer carrier, a polishing pad, and mechanical arm members” (column 3 lines 4-8), emphasis added. All of these components are within the pressure train of the wafer polishing subsystem of a chemical mechanical polisher. Further, Lin restricts his invention to “detecting pressure distribution on a *wafer* surface.”

There is no way that Lin could detect pressure distribution on a *wafer* surface by measuring the pressure on the *conditioner*, as presently claimed, and thus, Lin never describes any components of the conditioner subsystem. Lin stops in his description of pressure monitoring at the wafer polishing subsystem. The present invention as claimed is directed toward a different subsystem of the chemical mechanical polisher, which is the conditioner subsystem. As described above, Lin does not mention any of the components of the conditioner subsystem.

The examiner has cited USPN 6,722,948 to Berman, who is one of the applicants of the present application, as support for the erroneous assertion that a conditioner is a “pressure related component” as the phrase is used by Lin. However, there is no mention in Berman of a conditioner being a “pressure related component.” Lin uses that phrase to describe a very specific subsystem within a chemical mechanical polisher, as described at length above. It is noted that, just because two references use a common phrase, it does not mean that each reference means the same thing by the phrase. However, in the present case, the phrase as used by Lin is not even found in Berman. Therefore, there is absolutely no support in Berman that a conditioner is a “pressure related component” as the term is used in Lin.

However, Berman does provide some limited degree of insight into the present situation. It is very evident by Fig. 1 of Berman that the wafer polishing subsystem and the conditioner subsystem of a chemical mechanical polisher are separate systems. Thus, it is evident that all of the references in Lin to the pressure related components, which are used in conjunction with the wafer polishing subsystem, are not a part of the conditioner subsystem.

Thus, claim 1 patentably defines over Lin, and the rejections are in error. Dependent claims 2-7 depend from independent claim 1, and contain additional important

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aspects of the invention. Therefore, dependent claims 2-7 patentably define over Lin, and the rejections are in error.

CLAIMS 8 AND 19

Claims 8 and 19 are argued as a group, and are patentably distinct from claims 1-7, and 9 and 20, because they additionally recite steps such as optically scanning and digitizing the impressions, and comparing the impressions to a database of images. These steps dramatically change the breadth of the claims, and recite elements of the invention that dramatically build upon the more fundamental parts of the invention, such as described in claims 1-7.

For example, dependent claim 8 recites *inter alia*, in addition to the elements of claim 1 from which it depends, comparing the scanned and digitized impression to a database of scanned and digitized impressions. Lin describes capturing image data, but does not describe comparing any of the captured image data. Therefore, claim 8 patentably defines over Lin for these additional reasons, and the rejections are in error.

Independent claim 19 recites *inter alia*, in addition to the elements that it has in common with claim 1, both comparing the scanned and digitized impression to a database of scanned and digitized impressions (similar to that recited in claim 8), and also correcting the sources of the non-uniformities. Lin does not describe either of these two steps, and so claim 19 patentably defines over Lin for these additional reasons, and the rejections are in error.

CLAIMS 9 AND 20

Claims 9 and 20 are argued as a group, and are patentably distinct from claims 1-7, and 8 and 19, because they additionally recite steps such as optically scanning and digitizing the impressions, and associating meta data with the scanned images. These steps dramatically change the breadth of the claims, and recite elements of the invention that dramatically build upon the more fundamental parts of the invention, such as described in claims 1-7.

Dependent claim 9 recites *inter alia*, in addition to the elements of claim 1 from which it depends, associating with the scanned and digitized impression, data in regard to

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conditions of the chemical mechanical polisher at a time that the impression was created. Line does not describe associating any such meta data with the captured image data. Therefore, claim 9 patentably defines over Lin for these additional reasons, and the rejections are in error.

Dependent claim 20 recites *inter alia*, in addition to the elements of claim 19 from which it depends, associating with the scanned and digitized impression, data in regard to conditions of the chemical mechanical polisher at a time that the impression was created. Line does not describe associating any such meta data with the captured image data, or the other elements of claim 19 recited above. Therefore, claim 20 patentably defines over Lin for these additional reasons, and the rejections are in error.

COMMENTS ON EXAMINER'S POSITIONS

The examiner states that "Lin clearly states that the pressure components are *not* limited to what applicant calls the wafer polishing subsystem, but any pressure related component used in a chemical mechanical polishing system." Applicants are unable to find this statement anywhere in Lin. The allegation made by the examiner is improper in that it misconstrues the language of Lin.

The examiner also states that "a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art." While this may well be true for an apparatus claim, the present claims are directed towards a method, where performing an action with a given item is a valid limitation and patentable distinction between the method as claimed and the prior art. It is further noted that the present method is not a "process of making," as implied by the examiner in her reliance on *In re Casey*, such as a product by process. Thus, there is no required "intended use" of any article made by the process.

The examiner further states that "Berman does prove that a conditioner is inherently a pressure related component in a chemical mechanical polishing system." Again, the examiner has provided no support for this allegation. The examiner is obligated to recite that language in Berman that supports this allegation. In the absence of such, the allegation made by the examiner is improper. Applicants note that many polishing systems are not connected to a conditioning system. The fact that a polishing

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system may be built onto a common frame with a conditioning system does not make the conditioning system an inherent part of a polishing system.

Further, the allegation once again confuses the more important issue that different references may use the same words to refer to different things. The examiner has adapted the language "pressure related components" to suit her purpose, while ignoring how the references may (or may not) use the language. Lin has not used the language "pressure related components" in the manner specified by the examiner. Neither has Berman. Yet the examiner asserts that the phrase reads on elements that are not described in Lin, and which are depicted as separate elements in Berman.

For these reasons, applicants maintain their assertion that the examiner has impermissibly broadened the language of Lin in making the rejections.

CONCLUSION

In light of the deficiencies of the rejections described at length above, claims 1-9 and 19-20 should be allowed and the rejections to these claims reversed.

Sincerely,

LUEDEKA, NEELY & GRAHAM, P.C.

By: 

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VIII. CLAIMS APPENDIX

1. (original) A method for inspecting a uniformity of pressure applied between a conditioner and a polishing pad on a chemical mechanical polisher, the method comprising the steps of:
5 placing a sheet of pressure sensitive material between the conditioner and the polishing pad,
lowering the conditioner onto the sheet of pressure sensitive material,
applying a desired degree of pressure between the conditioner and the polishing pad, thereby creating an impression in the sheet of pressure sensitive material,
10 lifting the conditioner from the sheet of pressure sensitive material, and
inspecting the sheet of pressure sensitive material to determine the uniformity of the pressure applied between the conditioner and the polishing pad.
2. (original) The method of claim 1, further comprising the step of correcting sources of any non-uniformities detected in the pressure applied between the conditioner and the polishing pad.
3. (original) The method of claim 1, wherein the step of inspecting the sheet of pressure sensitive material comprises a visual inspection.
4. (original) The method of claim 1, wherein the impression indicates that a pressure threshold has been exceeded.
5. (original) The method of claim 1, wherein the impression exhibits varying degrees of a single characteristic of indication based upon varying degrees of pressure applied between the conditioner and the polishing pad.
6. (original) The method of claim 1, wherein the impression exhibits multiple characteristics of indication based upon varying degrees of pressure applied between the conditioner and the polishing pad.

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7. (original) The method of claim 1, wherein the impression exhibits varying colors based upon varying degrees of pressure applied between the conditioner and the polish pad.
8. (original) The method of claim 1, wherein the step of inspecting the sheet of pressure sensitive material to determine the uniformity of the pressure applied between the conditioner and the polishing pad further comprises:
5 optically scanning and digitizing the impression on the sheet of pressure sensitive material, and
comparing the scanned and digitized impression to a database of scanned and digitized impressions.
9. (original) The method of claim 1, further comprising the steps of:
optically scanning and digitizing the impression on the sheet of pressure sensitive material,
5 associating with the scanned and digitized impression data in regard to conditions of the chemical mechanical polisher at a time that the impression was created, and
storing the scanned and digitized impression and associated data in a database.
10. (cancelled)
11. (cancelled)
12. (cancelled)
13. (cancelled)
14. (cancelled)
15. (cancelled)
16. (cancelled)
17. (cancelled)
18. (cancelled)
19. (original) A method for inspecting a uniformity of pressure applied between a conditioner and a polishing pad on a chemical mechanical polisher, the method comprising the steps of:
5 placing a sheet of pressure sensitive material between the conditioner and the polishing pad,

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- lowering the conditioner onto the sheet of pressure sensitive material,
applying a desired degree of pressure between the conditioner and the polishing
pad, thereby creating an impression in the sheet of pressure sensitive
material,
- 10 lifting the conditioner from the sheet of pressure sensitive material,
inspecting the sheet of pressure sensitive material to determine the uniformity of
the pressure applied between the conditioner and the polishing pad, by
optically scanning and digitizing the impression on the sheet of pressure
sensitive material, and
- 15 comparing the scanned and digitized impression to a database of scanned
and digitized impressions, and
correcting sources of any non-uniformities detected in the pressure applied
between the conditioner and the polishing pad.
20. (original) The method of claim 19, further comprising the steps of:
associating with the scanned and digitized impression data in regard to conditions
of the chemical mechanical polisher at a time that the impression was
created, and
- 5 storing the scanned and digitized impression and associated data in the database.